

RDM: Beyond the Basics



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Agenda

- Quick overview of RDM
- RDM Parameter Messages
- The standards that make up RDM
- Overview of useful PIDs
- RDM time savers
- E1.33 / RDMnet

Overview of RDM

- An enhancement to USITT DMX512 for configuration, status monitoring, and management of DMX512 based systems.
- An open standard developed by the PLASA Technical Standards Program that allows interoperability between many manufacturers.
- Compliant DMX512 and DMX512-A devices are completely functional when RDM is present.
- Proper cable types and end-of-line termination is a must when using RDM.

RDM Parameters

- Once an RDM controller has discovered a responder, it can send GET or SET commands to the responder.
- The format of these commands are defined in the parameter message.
- Some types of commands may require additional data, for example SET DMX_START_ADDRESS.
- Each type of parameter message is assigned a 2 byte Parameter Identifier (PID).

RDM Parameters

- PIDs allow us to extend RDM, without having to change the original standard.
- PIDs also allow manufacturers to extend RDM outside the PLASA standards process but such extension messages are limited to their own equipment.
- A responder isn't required to support all PIDs, manufacturers make the decision which PIDs to implement.
- If a responder is missing a PID and you think it would be useful, ask the manufacturer!

RDM - More than just E1.20

E1.20, RDM-Remote Device Management over USITT DMX512 Networks	Published in 2006, revised in 2010
E1.37-1, Additional Message Sets for ANSI E1.20 (RDM) – Part 1, Dimmer Message Sets	Published in 2012
E1.37-2, Additional Message Sets for ANSI E1.20 (RDM) – Part 2, IPv4 & DNS Configuration Messages	Completed 2nd Public Review in October 2012
E1.37-3, Additional Message Sets for ANSI E1.20, LED walls and video displays	Planning stages
E1.33, Transport of ANSI E1.20 (RDM) in an E1.31 environment	Completed 2nd Public Review in October 2012

Selected PIDs from E1.20

Features you may not know you had:

- Lamp On / Off
- Device Reset
- Adjust Personalities
- Read sensor information
 - The RDM protocol supports many different types of sensors, including temperature, humidity, voltage, current, acceleration, pressure and more.

Selected PIDs from E1.37-1

E1.37-1 contains many PIDs which are relevant to dimmers.

- Dimmer curves
- Min & Max dimmer levels
- Startup mode
- Fail mode
- Output Response time
- Lock codes

Selected PIDs from E1.37-2

E1.37-2 focuses on configuring IPv4 and DNS settings

- List network interfaces
- IPv4 address & network mask
- DHCP mode
- Default Route
- DNS hostname
- DNS nameserver

We expect these to be used widely with E1.33 devices.

Proposed features for E1.37-3

E1.37-3 focuses on expanding RDM / RDMnet support to video devices monitoring and configuration.

- LED Walls
- Creative LED systems
- Projection
- Image Processing
- Video Switchers/Routers

Researching Products

- <http://rdm.openlighting.org> contains an index of RDM products
- For each product it tracks:
 - Software versions
 - Supported PIDs
 - Sensor types
 - Personalities
- If you're a manufacturer it's easy to get your products listed, see me after the session.

Save and Restore Settings

- RDM makes it easy to take a snapshot of the settings for a rig and then restore them at a later date.
- You could also take a before and after snapshot, and compare the differences.

What Is E1.33?

- Brings the benefits of bi-directional communication to IP networks.
- E1.33 is to E1.31 (sACN) as RDM is to DMX512
- Can be thought of as RDM for Ethernet
- Three parts:
 - Discovery
 - Node Configuration
 - RDM Message passing

Nodes connected to an E1.33 network are either:

- Controllers, typically consoles or monitoring devices
- Devices (can act as a DMX512/RDM gateway, native E1.31 device or both)

E1.33 Discovery

- E1.33 discovery builds on a technology called SLP (Service Location Protocol)
 - Established protocol most commonly used for discovering printers on a network.

SLP Terms:

- Service Agents (SA) are hosts that provide a service, e.g. a printer. In E1.33 SAs are the gateways or native devices.
- User Agents (UA) are hosts that use a service. In E1.33 UAs are the consoles or monitoring equipment
- Directory Agents (DAs) are specific network hosts that act as a rendezvous point in larger networks

E1.33 Discovery

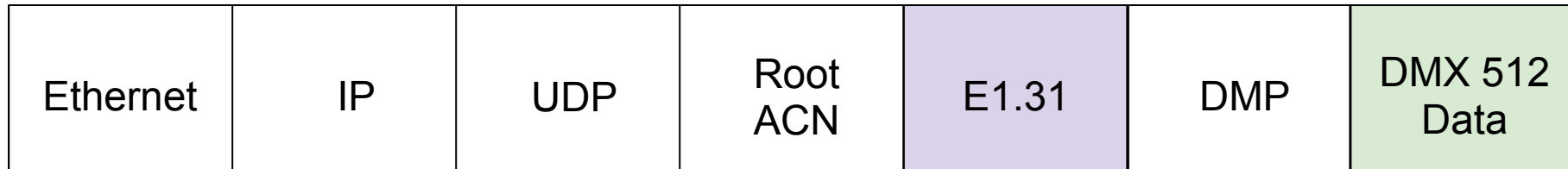
- E1.33 networks can operate in one of two modes
 - No Directory Agents (DAs)
 - One or more Directory Agents
- DAs allow E1.33 to scale to very large networks
- We generally expect consoles to implement the DA feature, this isn't required though.
- No configuration is required to switch modes, when a DA exists the hosts will use it, otherwise they'll fall back to non-DA mode.

E1.33 Discovery

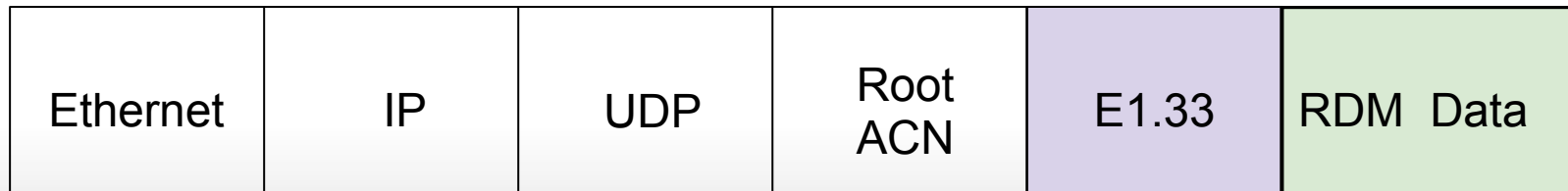
- Once a controller has discovered the IP address of all devices, it can then ask each device to enumerate the endpoints it contains using the ENDPOINT_LIST PID
- Controllers can then fetch a list of all UIDs connected to each endpoint
- This completes the discovery phase, the controller now has a complete list of UIDs, and which endpoints & devices they are attached to.
- Controllers can then start communicating with the RDM devices.

E1.33 Requests & Responses.

- RDM messages are wrapped in a similar packet structure as E1.31



E1.31 Packet



E1.33 Packet

E1.33 Device Configuration

- Allows assigning gateway endpoints (DMX512 ports) to sACN universes.
- An endpoint can be in either Composite or Standard universe mode.
 - Standard universes provide for complete mapping of an entire universe directly to an endpoint without any other manipulation.
 - A Composite universe is a universe that is constructed by merging, re-patching, or manipulating the Null Startcode data from one or more E1.31 universes to create a new universe of DMX512 data.
 - The mapping is outside of E1.33.
 - Removes the ability to do DMX address auto-patching.

E1.33 Device Configuration

Some of the new PID messages for E1.33:

- **ENDPOINT_LIST** - Provides packed list of Endpoint IDs on a Gateway/Device.
- **ENDPOINT_IDENTIFY** - Provides visual identification of the Gateway Port.
- **ENDPOINT_TO_UNIVERSE** - Assigns a given endpoint to a Universe. (Native devices also).
- **RDM_TRAFFIC_ENABLE** - Enables/Disables RDM traffic on an output endpoint for non-compliant legacy devices.
- **INITIATE_DISCOVERY**
- **BACKGROUND_DISCOVERY**- Enables/Disables auto discovery.
- **ENDPOINT_TIMING** - Configure endpoint refresh/timing profile.

Over to you...

What features would you like to see in RDM?

More Information?

- PLASA Control Protocols Booth
 - Booth #2041 (across from the PLASA booth)
- <http://www.rdmprotocol.org>
- <http://rdm.openlighting.org>